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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/010,696	12/05/2001	Visvamohan Yegnashankaran	072219-0261614 (P05088)	7056

33402 7590 09/23/2004

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EXAMINER

VU, QUANG D

ART UNIT PAPER NUMBER

2811

DATE MAILED: 09/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

62

Office Action Summary

Application No.

10/010,696

Applicant(s)

YEGNASHANKARAN ET AL.

Examiner

Quang D Vu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-5,8-10,26,33-36 and 45-55 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2-5,8-10 and 45-55 is/are allowed.
- 6) ☒ Claim(s) 26 and 33-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 26 and 33-36 are rejected under 35 U.S.C. 102(e) as being anticipated by US

Patent No. 6,437,441 to Yamamoto.

Regarding claim 26, Yamamoto (figures 18A-21J) teaches a multilevel metal interconnect comprising:

a layer of isolation material (12);

a first plurality of metal lines (18) that lie in substantially a first horizontal plane, the first plurality of metal lines including first (left [18]), second (middle [18]), and third (right [18]) metal lines formed on the layer of isolation material (12), the first (left [18]), second (middle [18]), and third (right [18]) metal lines each having a top surface, a bottom surface, and side wall surfaces that contact the top and bottom surfaces;

a first dielectric material (28) (column 18, lines 31-33), the first dielectric material (28) being formed between the first (left [18]) and second (middle [18]) metal lines so that the first dielectric material (28) contacts the side wall surface of the first metal line (left [18]) at a point and extends horizontally from the point to contact the side wall surface of the second metal line

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(middle [18]), lying in a first region (a portion region that is located between the middle [18] and the right [18]) that lies horizontally entirely between the second (middle [18]) and third (right [18]) metal lines so that the first dielectric material (28) contacts the side wall surface of the second metal line (middle [18]), and contacting the top surfaces (a portion top surface of the second [middle {18}] and the third [right {18}]) of the second (middle [18]) and third (right [18]) metal lines; and

a second dielectric material (62) (column 27, lines 62-63) formed over the first region (a portion region that is located between the middle [18] and the right [18]), the second dielectric material (62) contacting the first dielectric material (28) and having a dielectric constant (62; column 27, lines 62-63) different from a dielectric constant (28; column 18, lines 31-33) of the first dielectric material. Additionally, the first dielectric material (28) is different material from the second dielectric material (62). Therefore, the first dielectric has a different dielectric constant of the second dielectric.

Regarding claim 33, Yamamoto teaches a second plurality of metal lines (22) that lie in substantially a second plane, the second plurality of metal lines (22) including fourth (left [22]) and fifth (right [22]) metal lines that contact the first dielectric material (28), the fourth (left [22]) and fifth (right [22]) metal lines each having a top surface, a bottom surface, and side wall surfaces.

Regarding claim 34, Yamamoto teaches the second dielectric material (62) is formed in a second region that lies horizontally entirely between the fourth metal line (left [22]) and the fifth metal line (right [22]).

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Regarding claim 35, Yamamoto teaches the second region includes the first dielectric material (28) such that the first dielectric material (28) contacts the fifth metal line (right [22]) (see figure 21J; the first dielectric material [28] contacts to the side of the fifth metal line [right {22}])).

Regarding claim 36, Yamamoto teaches the second dielectric material (62) is formed on and over the second region.

Allowable Subject Matter

3. Claims 2-5, 8-10 and 45-55 are allowed.

Response to Arguments

Applicant's arguments with respect to claims 26 and 33-36 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quang D Vu whose telephone number is 571-272-1667. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

qv
September 17, 2004


DONGHEE KANG
PRIMARY EXAMINER